

# **Bridge Inventory & Structural Recommendation Report** **For** **US-191 over Colorado River near Moab (Design Bid Build)**

**Structures:**  
**New Replacement Bridge over the Colorado River**  
**New Pedestrian Bridge across the Colorado River**

EXISTING



NEW



<b>Region:</b> 4 Price	<b>Project Manager:</b> Kirk Thornock
<b>Pin:</b> 5365	<b>Project Number:</b> BRF-0191(58)129
<b>FiNet Number:</b> 525201D / 5250215D	<b>Fiscal Year:</b> 2009

<b>Prepared by/Date:</b> Cody Buzianis/ August 13, 2008
<b>Signature, Director of Bridge Design:</b> Stan Burns
<b>Signature, Director of Bridge Operations:</b> Rukhsana Lindsey

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# REPORT SUMMARY

## **Scope of Project:**

### **1. Purpose of Report**

The purpose of this report is to provide a scope for a design build project involving roadway widening, new pedestrian bridge and a new replacement bridge currently being designed to span the Colorado River at US-191 in Moab, UT. This new bridge will meet current structural design standards, increase safety, decrease congestion and blend with the unique environmental surroundings. All this is to be done while minimizing river and environmental impacts, enhancing trail network, minimizing MOT and involving the community. This report is intended to convey the need, scope, schedule, budget, safety and quality control process for the structure portion of this project.

### **2. Project Information**

**Region:** 4 Price      **Route No.:** 0191      **Date:** August 2008

**Project Name:** US-191 over Colorado River in Moab, UT (Design Build)

**R.P.:** 192.00

**Project Number:** BRF-0191(58)129      **PIN:** 5365

**FiNet Number:** 525201D / 5250215D

**Project Design:** Figg Bridge Engineers      **Design Engineer:** Hw. Lochner Inc.

**Resident Engineer:** Russel Tangren      **Project Mgr:** Kirk Thornock

### **3. Deficiencies & History:**

Bridge	Year Built	Sufficiency Rating	Deck	Super	Sub	Channel	Waterway
0C-285	1955	47	6	6	5	6	7

**4. Plan:**

The existing 8 span structure (C-285) consisting of 2 lanes and narrow shoulders fails to meet capacity and safety needs. The proposed plan will have two twin structures (NB & SB) running side by side (2 lanes each) 6 feet from each other crossing the Colorado River with only 3 spans on each. US-191 will be widened from the existing 2 lanes to 5 lanes 1400 feet on either end of the bridge. SR-128 will have a left turn lane added along with an estimated 400 feet of widening. A Pedestrian Bridge will also be constructed connecting trails across the river just east of the New Colorado River Structures.

**5. Work items to be completed:**

This project will include the following items:

- Phase 1 Construction- Build New SB Bridge.
- Phase 2 Construction- Removal of Existing Structure (C-285).
  - Abutments, Approach Slabs, Land Piers and River Piers (piles remain)
- Phase 3 Construction- Build New NB Bridge.
- 2-1/2" Integral Concrete Overlay.
- Parapet Sealing.
- Construction of New Pedestrian Bridge over the Colorado River.
- Widening of US-191 to 5 lanes (4 lanes and 1 median).
- Widening and addition of a left hand turn lane to SR-128.

**6. Work items to be deferred:**

This project won't include the following items:

- Roadway and safety items beyond what is related to the new structures.

**7. Design Exceptions:**

No Design Exceptions are expected.

**8. Maintenance Considerations:**

Include Region 4 Maintenance Station 4424 in the concept development.

**9. Construction Considerations:**

**ABC-** UDOT and the DB team will incorporate ABC techniques on the design and construction of the Overpass SPUI Bridge to minimize impact to traffic and reduce construction timeframe of the bridge. The Contractor will be required to provide assistance to the design team for the ABC implementations. Such ABC measures are as follows:

- Cantilever movement strategically planned for optimization of construction time frame and Cast-In-Place production rates
- Standardize superstructure type and/or framing plan for shortened fabrication and casting.
- Longer Spans
- Optimize Foundation Type

Limitations of Operations, Incentives, CMGC, Design Build, A+B, weekend and night work will be evaluated. **To accommodate traffic during construction and minimize impacts, the bridge construction will be constructed in 4 phases. The first phase will be forming and constructing the New SB Bridge along side the existing structure. After completion, traffic will be moved to this bridge initializing the second stage of construction. The second stage is the removal of the existing structure. Following complete removal, the third stage of construction will begin, forming and constructing the New NB Bridge. After completion, the fourth stage of construction will be opening the New NB Bridge to traffic. (Refer to page 9)** Short term closures may be needed to move equipment and for roadway tie-ins.

**10. Risk Analysis:**

Partnering between the owner, designers, suppliers, contractors, is key to the success of the project.

**11. Development Process:**

New or Major Reconstruction	<u>  x  </u>
Rehabilitation	<u>      </u>
Preservation	<u>      </u>

**Schedule of Project:**

This will be a design build project. A tentative schedule at this time is:

- |   |               |
|---|---------------|
| 1. Advertisement:                         | October 2008  |
| 2. Project Award:                         | Nov/ Dec 2008 |
| 3. Begin Construction of Bridge           | Spring 2009   |
| 4. Complete Construction of whole project | Fall 2011     |

**Budget of Project:**

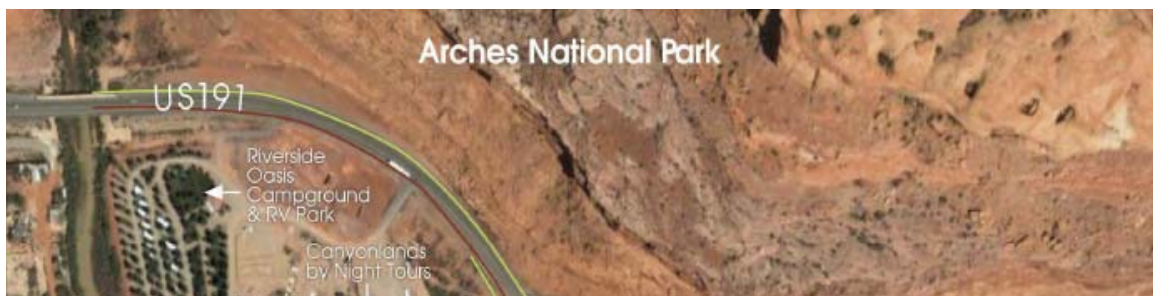
- |   |              |                  |           |
|---|--------------|------------------|-----------|
| 1. Funding Sources: BR_ON/OFF               | EQ_BONUS(MG) | ST_GF_BRIDGE     | ST_GF_HCP |
| 2. CAA                                      |              | \$ 38,459,999.00 |           |
| 3. Structural Cost Estimate (2009 Dollars): |              | \$ 37,161,036.30 |           |

US-191 over Colorado River Design Bid Build				
ITEM	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>STRUCTURE ITEMS</b>				
<b>Removal of Existing Bridge 0C-285</b>				
Removal of Bridge (1000' x 19')	19000	SF	\$ 25.00	\$ 475,000.00
<b>Bridge Subtotal</b>				<b>\$ 475,000.00</b>
<b>New Segmental Bridge over Colorado River</b>				
Build Twin CIP Concrete Box Girders (1,022' x 39.8' each )	81413	SF	\$ 250.00	\$ 20,353,130.00
2-1/2" Integral Concrete Overlay	628	CY	\$ 500.00	\$ 314,091.51
Parapet Sealing	4288	LF	\$ 5.00	\$ 21,440.00
<b>Bridge Subtotal</b>				<b>\$ 20,688,661.51</b>
<b>New Pedestrian Bridge over Colorado River</b>				
Build New Pedestrian Bridge (approx. 1,022' x 8')	8176	SF	\$ 250.00	\$ 2,044,000.00
<b>Bridge Subtotal</b>				<b>\$ 2,044,000.00</b>
<b>Structure Subtotal</b>				<b>\$ 23,207,661.51</b>
<b>ROADWAY ITEMS</b>				
Roadway Widening at US-191 and SR-128 (Refer to Note 1)	1	LUMP	\$ 2,956,500.00	\$ 2,956,500.00
Utilities and Drainage	1	LUMP	\$ 75,000.00	\$ 75,000.00
Traffic Control	1	LUMP	\$ 300,000.00	\$ 300,000.00
Mobilization	1	LUMP	\$ 500,000.00	\$ 500,000.00
Public Information Service	1	LUMP	\$ 5,000.00	\$ 5,000.00
M.O.T.	1	LUMP	\$ 200,000.00	\$ 200,000.00
<b>Roadway Subtotal</b>				<b>\$ 4,036,500.00</b>
<b>Project Subtotal (2008 Dollars)</b>				<b>\$ 27,244,161.51</b>
PE/CE 16%				\$ 4,359,065.84
Contingency 8%				\$ 2,179,532.92
<b>Project Total before Inflation</b>				<b>\$ 33,782,760.28</b>
<b>Inflation Rate @ 10% over 1 year</b>				<b>\$ 3,378,276.03</b>
<b>Project Total (2009 Dollars)</b>				<b>\$ 37,161,036.30</b>



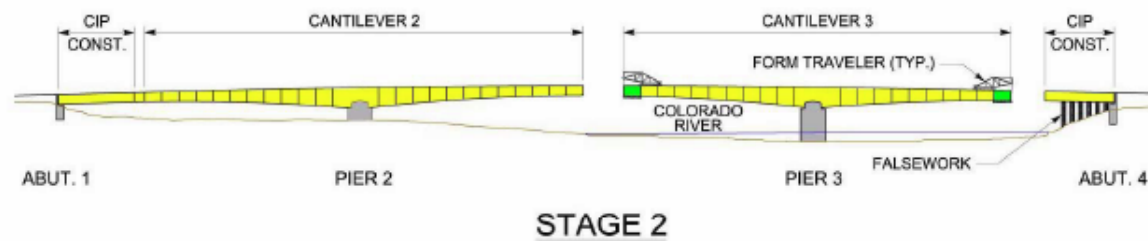
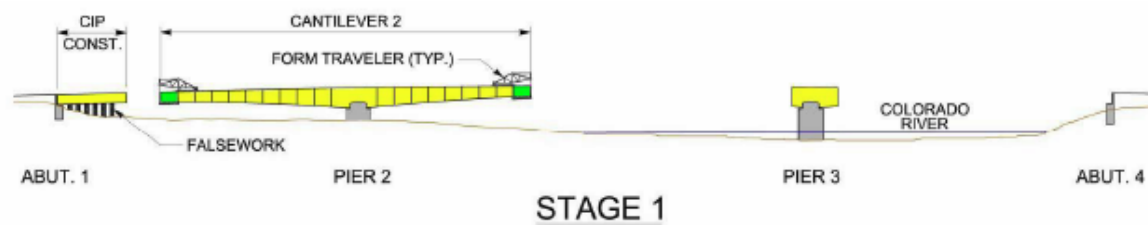
NOTE 1				
Roadway Widening at US-191 and SR-128	QUANTITY	UNIT	UNIT COST	TOTAL COST
Riprap	2000	CY	\$ 80.00	\$ 160,000.00
18" Pipe	1720	LF	\$ 70.00	\$ 120,400.00
24" Pipe	500	LF	\$ 100.00	\$ 50,000.00
Concrete Small Structure	28	CY	\$ 1,500.00	\$ 42,000.00
Reinforcing Steel (coated)	3500	LBS	\$ 0.40	\$ 1,400.00
Barrier/Moment Slab	450	LF	\$ -	\$ -
Borrow	25,000	CY	\$ 20.00	\$ 500,000.00
Embankment for Bridge	21060	TON	\$ 20.00	\$ 421,200.00
Excavation	5000	CY	\$ 12.00	\$ 60,000.00
UBC	9000	TON	\$ 15.00	\$ 135,000.00
HMA- 3/4"	8050	TON	\$ 80.00	\$ 644,000.00
Rotomilling- 2"	6000	SY	\$ 1.25	\$ 7,500.00
CIP Constant Slope Barrier	1850	LF	\$ 150.00	\$ 277,500.00
MSE Walls (Concrete Panels- Bridge and Trails)	10,750	SF	\$ 50.00	\$ 537,500.00
<b>Roadway Widening Subtotal</b>				<b>\$ 2,956,500.00</b>

## Location Map

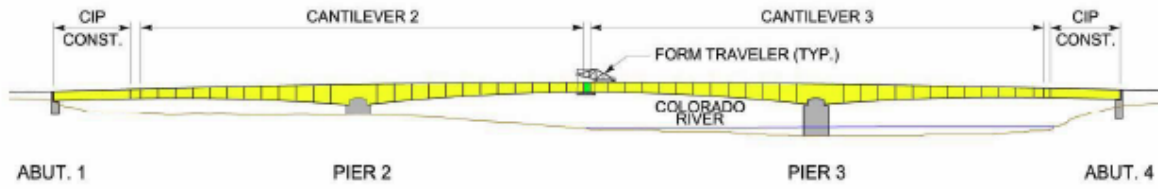


Vbfb  
Gf  
Gdf

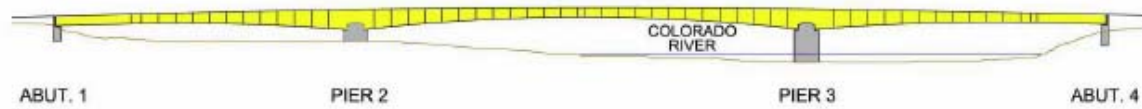
## **CONSTRUCTION SEQUENCE**





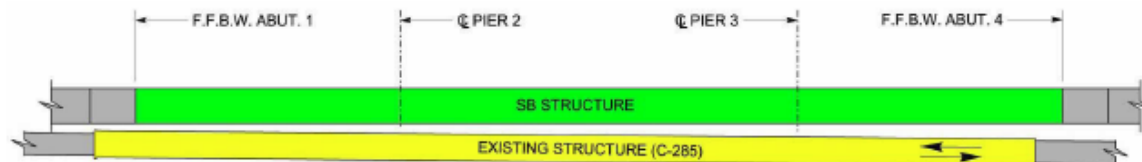


**STAGE 3**

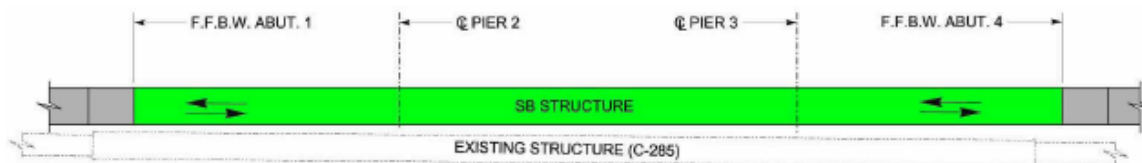


**STAGE 4**

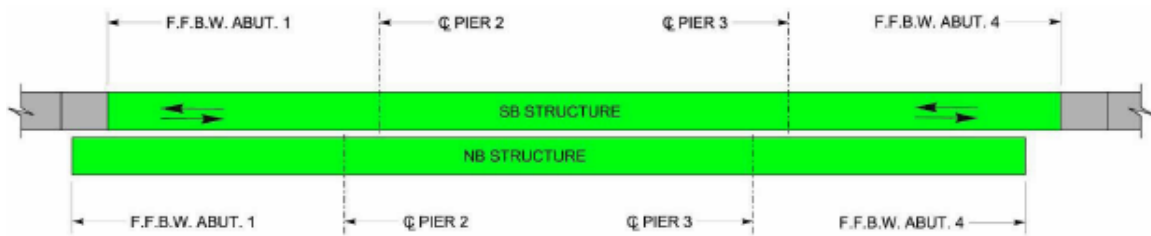
## CONSTRUCTION PHASING



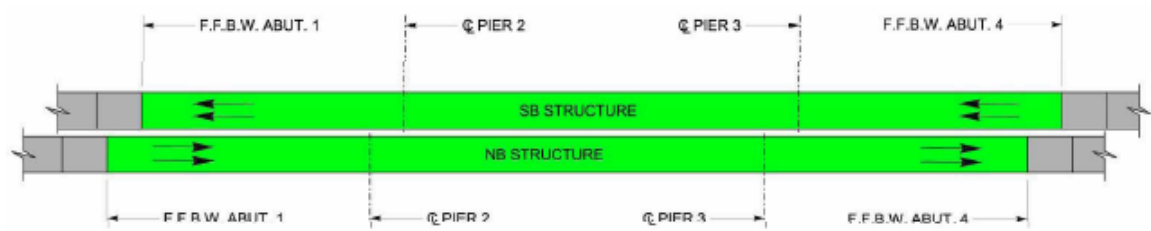
**Phase 1**



**Phase 2**

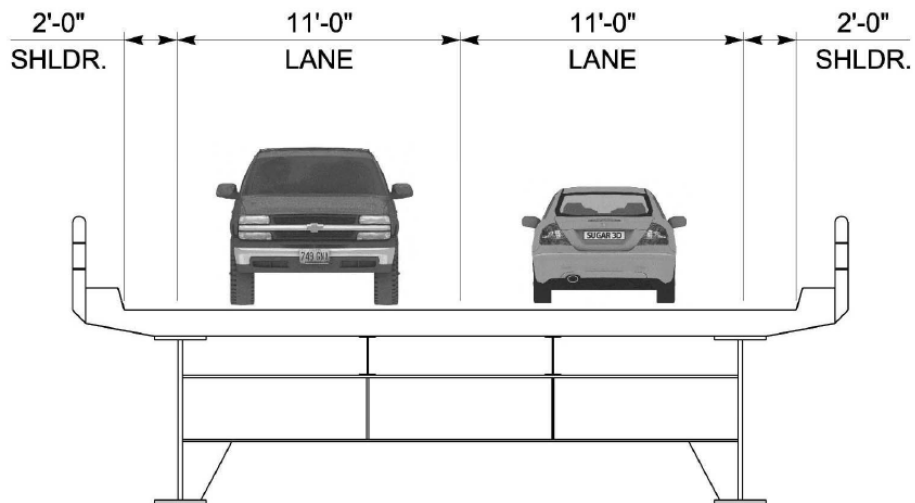


**Phase 3**



**Phase 4**

### Existing Bridge over Colorado River



## New Bridge over Colorado River

